

LEAMINGTON BURN STUDIES - SPECIAL PROJECTS

Introduction

In 1996, Utah experienced its most active, extensive, and devastating fire season. In Millard and Juab Counties alone, some 250,000 acres were burned. The Leamington Complex was the largest burned area covering approximately 138,340 acres of mostly pinyon-juniper woodland. Rehabilitation efforts began in the fall of 1996 which included drilling the more accessible low-lying areas, and then the remainder was aerially seeded and chained one-way to cover the seed. On the Leamington Complex, about 6,100 acres were treated with a rangeland drill, 10,736 acres were aerially seeded and followed by a one-way chaining with an Ely chain to help cover the seed, and 8,308 acres were aerially seeded only. Aerially seeding and then chaining is an effective method of breaking up burned trees which provide valuable surface litter to help protect the soil from erosion, as well as enhancing seedling establishment by covering the seed. This practice was stopped temporarily because of concerns voiced by environmental and Native American groups with regard to archeological resources in the burned areas even though an archeological survey had been completed. During the summer of 1997, two permanent range trend study sites were placed; one located in a burned and seeded area, and the other established in the immediate area where it had been burned, seeded, then chained one-way. The purpose of these sites was to monitor any differences in secondary succession and seedling establishment on these two treatments. Four (2 paired sites) additional trend studies were established in 1998. Data summaries from these sites are found in this section including study site maps, data tables and a text narrative.

Seed Lists

Leamington Burn (21-10) and Leamington Burn & Chain (21-21) sites occur within the Little Sage chaining treatment area which included approximately 3,765 acres. The seed mix for the area is listed below.

Aerial Mix

Species	Pounds of Seed	Pounds per acre
High Crest (<i>Agropyron cristatum</i>)	12,450	3.3
Rye (<i>Elymus junceus</i>)	12,450	3.3
Tall wheatgrass (<i>Agropyron elongatum</i>)	8,300	2.2
Great Basin Wildrye (<i>Elymus cinereus</i>)	2,000	0.53
Smooth brome (<i>Bromus inermis</i>)	600	0.16
Alfalfa (<i>Medicago sativa</i>)	1,200	0.32
Small burnet (<i>Sanguisorba minor</i>)	500	0.13

Dribbler Mix

Fourwing saltbush (<i>Atriplex canescens</i>)	3,700	1.0
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Seed list for Paul Bunyon Burn (19B-19) and Paul Bunyon Burn & Chain (19B-20). Total treatment area is approximately 3,779 acres.

Aerial Mix

Species	Pounds of Seed	Pounds per acre
High Crest (<i>Agropyron cristatum</i>)	15,100	4.0
Rye (<i>Elymus junceus</i>)	11,350	3.0
Tall wheatgrass (<i>Agropyron elongatum</i>)	7,500	2.0

Dribbler Mix

Fourwing saltbush (<i>Atriplex canescens</i>)	3,800	1.0
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Seed list for Jericho State Section 19B-21. Treatment area included approximately 1,200 acres.

Aerial Mix

Species	Pounds per acre
High Crest (<i>Agropyron cristatum</i>)	5.0
Intermediate Wheatgrass (<i>Agropyron intermedium</i>)	3.0
Alfalfa (<i>Medicago sativa</i>)	1.0
Yellow Sweet Clover (<i>Melilotus officinalis</i>)	0.5

Seed list for Jericho BLM 19B-22. Treatment area included approximately 2,131 acres.

Aerial Mix

Species	Pounds of Seed	Pounds per acre
High Crest (<i>Agropyron cristatum</i>)	6,550	3.1
Rye (<i>Elymus junceus</i>)	4,400	2.1
Tall wheatgrass (<i>Agropyron elongatum</i>)	4,250	2.0
Smooth Brome (<i>Bromus inermis</i>)	4,000	1.9

Dribbler Mix

Fourwing saltbush (<i>Atriplex canescens</i>)	2,150	1.0
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SUMMARY

Site Comparisons between Leamington Burn & Seed 21-20 and Leamington Burn and Chain 21-21

1997 Comparisons

Basic ground cover characteristics are similar between the two sites but some slight differences are apparent. Vegetation cover is slightly higher on the unchained site. However, this is due primarily to the abundance of cheatgrass and annual forbs which are over two times more abundant and produced 4 times more cover here compared to the chained site. Litter cover is higher (7% vs 10%) on the chained site due in part to the presence of chained tree cover lying on the ground. This provides better soil protection than dead standing snags.

The chaining treatment provided for better seeded grass establishment. Seeded species, crested wheatgrass, intermediate wheatgrass, and orchard grass have a 35 times higher sum of nested frequency compared to the burn and seeded site. In contrast, native grasses established better on the unchained treatment where they were found to be three times higher in nested frequency. Unfortunately, the unchained site also provided a better environment for cheatgrass and weedy annual forbs to become established. Native species do not compete very well against cheatgrass. Cheatgrass is nearly twice as abundant and produces almost two times more cover on the unchained site while annual forbs are more than three times more abundant and produce twice as much cover.

Both sites had nearly identical low frequencies of the seeded forbs alfalfa and small burnet. From these preliminary findings, seeded grasses and forbs did not successfully establish on the unchained site after one growing season. In addition, seeded forbs did not establish well on the chained treatment. More data will need to be collected over several years to determine if these preliminary findings remain consistent.

1998 Comparison

Ground cover characteristics are very similar between sites with the only differences being slightly more vegetation cover and less rock cover on the unchained site. Erosion is not a problem on either site.

Shrubs are lacking on the unchained site. The few Nevada ephedra encountered in 1997 were not found in 1998. The chained site shows some establishment of the seeded shrub, fourwing saltbush. However, density is minimal at only 20 plants/acre. A few Nevada ephedra and bitterbrush were also picked up in 1998. Broom snakeweed is found in low densities on both sites, but density has declined from 500 to 400 plants/acre on the chained site while density has increased from 60 to 240 plants/acre on the unchained site. The chained site displayed a significant increase in the nested frequency of all but three grasses. Sum of nested frequency of perennial grasses increased from 271 to 422. Cover increased nearly 3 fold from 7% to 20%. Sum of nested frequency of perennial grasses on the unchained site remained similar (213 to 217) and cover increased from 5% to 11%. Cheatgrass dominates the herbaceous understory on the unchained site. Cover has increased 13 fold since 1997 from 2% to 26%. It currently provides 71% of the grass cover and 66% of the herbaceous cover. This is an increase from 1997 when cheatgrass accounted for only 33% of the grass cover. The chained site has a high nested frequency value for cheatgrass at 318 and cover has increased from 1.4% to 10%. However, cheatgrass cover is 2.6 times lower than the unchained site due to competition with perennial grasses. It is apparent that the only way to control cheatgrass on rehabilitation projects such as this is to make sure that perennial grasses become established in sufficient numbers so they can compete with the weedy species.

Forb composition is similar between sites. Seeded forbs occur at similarly low frequencies. Total forb cover is higher on the unchained site due to the presence of high numbers of weedy biennial and annual forbs. This is likely a function of the lack of competition with perennial grasses.